

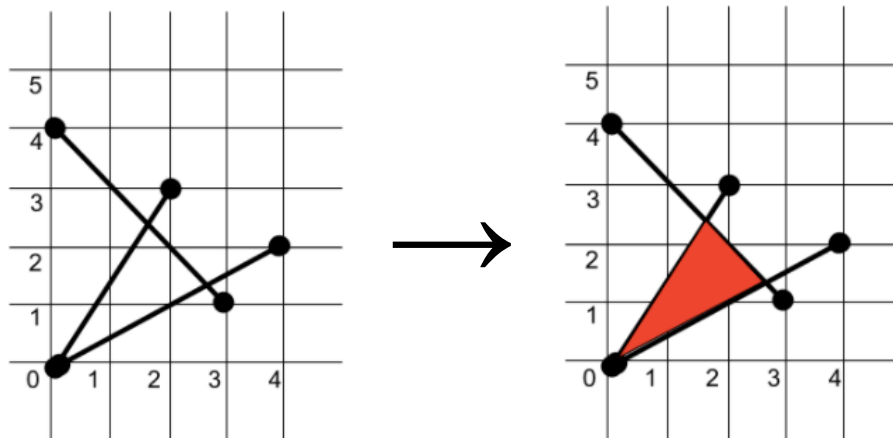
## 4. Dai

**Program Name:** Dai.java

**Test Input File:** dai.dat

Dai has a younger brother Dafydd, who likes to draw line segments, and has become very good at doing this. Dai wants to encourage this skill in his younger brother and is using his love of lines to teach Dafydd about polygons. Dafydd only draws straight line segments on a grid. On this grid, Dai determines if all the line segments collectively enclose a polygon, and if a polygon is enclosed, Dai tells Dafydd how many sides the polygon has.

For example, if Dafydd draws the following line segments,  $(0, 0) \rightarrow (2, 3)$ ;  $(0, 4) \rightarrow (3, 1)$ ;  $(0, 0) \rightarrow (4, 2)$ ,



they enclose a polygon, which in this circumstance has three sides. However, Dafydd doesn't always draw line segments that enclose a polygon. Sometimes no segments intersect, and sometimes the intersecting segments do not enclose a polygon. When this happens, there is no polygon. Given Dafydd's lines, help Dai write a program to determine the number of sides of the polygon enclosed by the segments. If there is no polygon, display 0.

**Input:** An initial value  $N$ , followed by  $N$  lines of data. Each line contains a series of non-negative integers in groups of 4 values, the first pair representing the  $(x,y)$  coordinates of the start of a line segment, and the second pair the  $(x,y)$  coordinates of the end of that line segment.

**Assumptions:** A polygon has at least 3 sides. There will be no more than 1 closed shape per drawing. There will be at least one line on a drawing.

**Output:** The number of sides of the polygon enclosed by Dafydd's lines, otherwise output 0.

**Sample Input:**

```
3
0 0 2 3 0 4 3 1 0 0 4 2
0 0 2 2 3 3 5 4 15 15 14 3
1 6 4 9 3 9 6 7 6 7 7 4 2 4 8 5 1 6 4 3 19 9 18 8
```

**Sample Output:**

```
3
0
5
```